NON-PUBLIC?: N
ACCESSION #: 9203250102
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Nine Mile Point Unit 1 PAGE: 1 OF 5

DOCKET NUMBER: 05000220

TITLE: Sticking Pivot and Worn Pin to Lever Connection on Turbine S
op
Valve Caused a Reactor Scram and HPCI Initiation
EVENT DATE: 02/16/92 LER #: 92-004-00 REPORT DATE: 03/18/92

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 094

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. L. Tessier, Manager Operations TELEPHONE: (315) 349-2707
NMP1

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On February 16, 1992, at 0059 hours, with the reactor mode switch in the "RUN" position and reactor power at approximately 94 percent, Nine Mile Point Unit 1 (NMP1) experienced Reactor Protective System (RPS) actuations. Specifically, a full reactor scram caused by a turbine stop valve closure signal to RPS channels 11 and 12, and an automatic initiation of High Pressure Coolant Injection (HPCI) caused by a turbine trip.

The root cause was determined to be equipment failure. Specifically, a sticking pivot point and a worn pin to lever connection on the Turbine Stop Valve failed to adequately perform their intended functions.

Corrective actions include cooling down the reactor in accordance with

plant procedures, and corrective maintenance on the turbine stop valve hydraulic control mechanisms.

This event is bounded by the discussion in the Final Safety Analysis Report (FSAR), Section XV. There were no adverse consequences to the health and safety of the general public or plant personnel as a result of this event.

END OF ABSTRACT

I. DESCRIPTION OF EVENT

On February 16, 1992, at 0059 hours, with the reactor mode switch in the "RUN" position and reactor power at approximately 94 percent, Nine Mile Point Unit 1 (NMP1) experienced Reactor Protective System (RPS) actuations. Specifically, a full reactor scram caused by a turbine stop valve closure signal to RPS channels 11 and 12, and an automatic initiation of High Pressure Coolant Injection (HPCI) caused by a turbine trip.

The scram occurred during weekly surveillance test N1-PM-W4, "Weekly Turbine Valve Log." While performing the opening test stroke on turbine stop valve number 13, the valve unexpectedly opened at a rate approximately twice that of normal and then closed as if a turbine trip had been initiated. Turbine stop valve 11 then fully closed and stop valves 12 and 14 partially closed, initiating the 10 percent Turbine Anticipatory Trip on stop valve closure RPS scram switches. An actual turbine trip signal occurred approximately 5 seconds after the reactor scram. Following the scram signal all control rods inserted to position 00. Turbine bypass valves and electromatic relief valves (ERV) opened in response to the increase in pressure. Peak reactor pressure during the transient was approximately 1100 psig, as evidenced by actuation of the electromatic relief valves. Torus water temperature increased by approximately 2 degrees Fahrenheit. The electromatic relief valves shut within 6 seconds. High Pressure Coolant Injection initiated on the turbine trip as expected and brought reactor water level up to 100 inches, which caused the #12 feedwater pump to trip on high water level. This is an expected response to this event. A normal reactor cooldown commenced after the scram transient.

Several minor problems were identified following the scram:

1. ERV-123 acoustic monitor failed to alarm. Positive indication that the valve opened exists.

2. IRM-12 responded erratically following the scram.

3. Computer points F120, Scram Dump Volume Vent, and F121, Scram Dump Volume Drain, printed with incorrect times on the process computer alarm typer.

II. CAUSE OF EVENT

A formal root cause investigation was performed and determined that the cause of the turbine stop valves closing during the surveillance test was equipment failure. Specifically, two components failed to adequately perform their intended function. A sticking pivot point located on the Turbine Stop Valve number 13 bypass testing mechanism, coupled with a worn pin to lever connection located on the Turbine Stop Valve number 13 pilot

II. CAUSE OF EVENT (cont.)

valve, caused the pilot valve to fail to modulate smoothly and the #13 Turbine Stop Valve to open at an accelerated rate. This accelerated opening rate caused a momentary decrease in emergency trip oil pressure in the Turbine Stop Valve hydraulic system. The decrease in hydraulic pressure caused the Turbine Stop Valve number 13 trip latch to unlatch and the valve to go full closed as if a turbine trip had occurred. Turbine Stop Valves 12 and 14 partially closed due to leakage past the disk dump valves and Turbine Stop Valve number 11 went fully closed, which initiated a scram on the RPS 10 percent stop valve closure signal.

III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73 (a)(2)(iv), "Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)."

This event is bounded by the discussion in the Final Safety Analysis Report (FSAR), Section XV, for Turbine Trip with Bypass Valve Operation at Full Power. The initiation of the reactor scram and High Pressure Coolant Injection are protective modes of operation and thus they performed their intended safety function. There were no adverse safety consequences as a result of this event nor was the reactor in an unsafe condition during or after this event.

There were no adverse consequences to the health and safety of the general public or plant personnel as a result of this event.

IV. CORRECTIVE ACTIONS

Short term corrective actions were:

1. Stabilized and cooled down the reactor in accordance with plant procedures.

2. Initiated Work Request (WR) #203705 to troubleshoot and identify the cause of failure to the Turbine Stop Valve 13 bypass mechanism control functions. It was possible to duplicate the Turbine Stop Valve failure event by repeating the test using a similar ramp rate.

IV. CORRECTIVE ACTIONS (cont.)

3. Initiated Work Request (WR) #203707 and #203706 to perform corrective actions to the turbine stop valve hydraulic control mechanisms. These Work Requests eliminated the binding, lubricated the mechanisms and adjusted the valve stroke timing. During implementation of these Work Requests, the failure event could not be duplicated even with opening ramp rates adjusted to twice the values exhibited during troubleshooting, and prior to the scram event.

4. Performed a root cause evaluation for the Turbine Stop Valve closure.

5. Work Request (WR) #202042 was written to investigate the ERV-123 acoustic monitor. I&C performed troubleshooting on the monitor and found no problems. Deviation/Event Report #1-92-Q-0506 was written to investigate this problem, and will be dispositioned prior to startup.

6. Work Request (WR) #202041 was written to troubleshoot the IRM-12 response. The power supply's preregulator and mean square analog modules were determined to have excessive AC voltage oscillations and were replaced.

Long term corrective actions are:

1. Computer points F120 (scram dump volume vent) and F121 (scram dump volume drain) printing with incorrect times was caused by saturation

of the process computer output buffer and occurs after a scram when many computer points need to be printed on the alarm typer. The process computer upgrade scheduled for 1994 will eliminate this problem.

2. Include turbine stop valve number 13 bypass valve pivots and linkages in a scheduled periodic inspection/maintenance program.

3. Evaluate increasing the surveillance testing period for turbine stop valves.

V. ADDITIONAL INFORMATION

A. Failed components: Turbine Stop Valve (GE #2) with internal bypass valve. Manufacturer is General Electric.

V. ADDITIONAL INFORMATION (cont.)

B. Previous similar events:

LER 91-02 describes a reactor scram from about 78 percent power due to high neutron flux. The turbine control valves partially closed due to the primary valve limit stop linkage bushing sticking.

LER 85-05 describes a reactor scram from power due to high neutron flux. The electronic pressure regulator was in control at the time of the scram, however, maintenance on the mechanical pressure regulator found the stroke to be binding and sticky.

LER 84-18 describes a reactor scram during startup, at approximately 4 percent thermal power, due to low reactor water level. The mechanical pressure regulator sent erroneous open and then close signals to the turbine bypass valves, causing reactor water swell and shrink. The mechanical pressure regulator was cleaned, lubricated and returned to service, and performed satisfactorily.

The corrective actions from these previous similar events would not have prevented this LER from occurring.

C. Identification of components referred to in this LER:

IEEE 803 IEEE 805
COMPONENT FUNCTION SYSTEM ID

Reactor Protection System N/A JC
High Pressure Coolant Injection System N/A BJ
Turbine Stop Valve ISV TA
Electromatic Relief Valves RV SB
Torus Suppression Chamber N/A NH
Feedwater Pump P SJ
Intermediate Range Monitor (IRM) XI JC
Scram Dump Volume VSL AA
Turbine Bypass Valves V JI

NIAGARA
MOHAWK

NIAGARA MOHAWK POWER CORPORATION/Nine Mile Point Nuclear Station
Unit #1, P.O. Box 32, Lycoming, NY 13093

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March 18, 1992

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

RE: Docket No. 50-220
LER 92-04

Gentlemen:

In accordance with 10CFR50.73, we hereby submit the following Licensee Event Report:

LER 92-04 Which is being submitted in accordance with 10CFR50.73 (a)(2)(iv), "Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF) including the Reactor Protection System (RPS)."

This report was completed in the format designated in NUREG-1022, Supplement 2, dated September 1985.

Very truly yours,

Kim A. Dahlberg
Plant Manager - NMP1

KAD/JTP/lmc
ATTACHMENT

xc: Thomas T. Martin, Regional Administrator Region I
Wayne L. Schmidt, Senior Resident Inspector

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